

AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED) A body fluid shunt comprising:
 - a. an inlet port;
 - b. an outlet port;
 - c. a fluid passage between the inlet and outlet ports;
 - d. a valve situated between the inlet and outlet ports, the valve defining:
 - (1) an upstream side of the fluid passage between the inlet port and the valve, and
 - (2) a downstream side of the fluid passage between the valve and the outlet port,and wherein the valve is at least partially defined by a drain port extending between the upstream and downstream sides of the fluid passage;
 - e. a piston:
 - (1) having a piston face defined on the upstream side of the fluid passage, wherein at least a portion of the piston face is defined by a deformable diaphragm,
 - (2) being rotationally displaceable to actuate the valve, and
 - (3) having a cutout defined therein, the cutout being alignable with the drain port when the piston is displaced,wherein:
 - i. fluid bearing on the piston face at or above a shunting pressure will displace the piston to actuate the valve, with alignment of the cutout and the drain port opening the valve to thereby allow passage of fluid between the inlet and outlet ports, and
 - ii. the position of the piston is independent of the pressure in the downstream side of the fluid passage.
2. (CANCELED)

3. **(ORIGINAL)** The body fluid shunt of claim 2 wherein the deformable diaphragm has opposing sides defining:
 - a. a fluid side, the fluid side being at least partially bounded by the upstream side of the fluid passage, and
 - b. a gas side, the gas side being at least partially bounded by a gas chamber, the gas chamber being closed to the ingress of fluid.
4. **(ORIGINAL)** The body fluid shunt of claim 3 wherein the gas chamber has selectively adjustable volume, whereby a user may selectively adjust the gas chamber volume to adjust the pressure of gas therein, and thereby adjust the gas pressure on the gas side of the deformable diaphragm.
5. **(ORIGINAL)** The body fluid shunt of claim 1 wherein:
 - a. the piston is displaceable along a piston travel axis; and
 - b. fluid flowing through the valve between the upstream and downstream sides of the flow passage flows along a valve flow direction oriented at least substantially perpendicular to the piston travel axis.
6. **(ORIGINAL)** The body fluid shunt of claim 1 wherein the piston includes:
 - a. a piston tail end opposite its piston face, and
 - b. an intermediate length extending between its face and piston tail end,and wherein the downstream side of the fluid passage opens onto the piston only at the intermediate length of the piston.
7. **(CANCELED)**

8. (CURRENTLY AMENDED) ~~The body fluid shunt of claim 1 wherein:~~

A body fluid shunt comprising:

- a. an inlet port;
- b. an outlet port;
- c. a fluid passage between the inlet and outlet ports;
- d. a valve situated between the inlet and outlet ports, the valve defining:
 - (1) an upstream side of the fluid passage between the inlet port and the valve, and
 - (2) a downstream side of the fluid passage between the valve and the outlet port,and wherein the valve is at least partially defined by a drain port extending between the upstream and downstream sides of the fluid passage;
- a. ~~the piston is at least partially defined by a mask, the mask being deformable whereby the mask bears against the drain port in accordance with any pressure differential between the upstream and downstream sides of the fluid passage; the mask having the cutout defined therein;~~
- e. a piston displaceable to actuate the valve, the piston having:
 - (1) a piston face defined on the upstream side of the fluid passage, at least a portion of the piston face being defined by a deformable diaphragm,
 - (2) a deformable mask thereon, the mask deforming to bear against the drain port in accordance with any pressure differential between the upstream and downstream sides of the fluid passage,
 - (3) a cutout defined within the deformable mask, the cutout being alignable with the drain port when the piston is displaced,

wherein:

- ~~b.~~ i. the valve has:
 - (1) a closed state wherein the mask covers the drain port;
 - (2) an open state wherein the piston is displaced to move the cutout of the mask into alignment with the drain port,
- ii. fluid bearing on the piston face at or above a shunting pressure will displace the piston to actuate the valve, with alignment of the cutout and the drain port

opening the valve to thereby allow passage of fluid between the inlet and outlet ports.

iii. the position of the piston is independent of the pressure in the downstream side of the fluid passage.

9. (CANCELED)
10. (PREVIOUSLY PRESENTED) The body fluid shunt of claim 8 wherein the mask is a flexible membrane.
11. (ORIGINAL) The body fluid shunt of claim 1 wherein the piston has a piston tail end opposite its piston face, and wherein the upstream side of the fluid passage opens onto the piston tail end.
12. (ORIGINAL) The body fluid shunt of claim 1 wherein the deformable diaphragm includes:
 - a. a fluid side, the fluid side being at least partially bounded by the upstream side of the fluid passage, and
 - b. an opposite side isolated from the upstream side of the fluid passage.
13. (ORIGINAL) The body fluid shunt of claim 12 wherein the opposite side is biased by at least one of:
 - a. a compressible gas chamber; and
 - b. a spring.
14. (PREVIOUSLY PRESENTED) The body fluid shunt of claim 12 wherein the opposite side is also isolated from the downstream side of the fluid passage.
15. (ORIGINAL) The body fluid shunt of claim 14 wherein the pressure on the opposite side is adjustable to a fixed level.

16. **(ORIGINAL)** The body fluid shunt of claim 15 wherein the opposite side is bounded by a gas chamber having selectively adjustable volume, whereby a user may selectively adjust the gas chamber volume to adjust the pressure of gas therein, and thereby adjust the gas pressure on the opposite side of the diaphragm.
17. **(CANCELED)**
18. **(ORIGINAL)** The body fluid shunt of claim 1 wherein the inlet port is in fluid communication with a brain.
19. **(ORIGINAL)** The body fluid shunt of claim 1 wherein the outlet port has an elongated flexible catheter extending therefrom.
20. **(ORIGINAL)** The body fluid shunt of claim 1 wherein:
- a. the inlet port is in fluid communication with a first cavity in a human body, and
 - b. the outlet port is in fluid communication with a second cavity in the body.
21. **(ORIGINAL)** The body fluid shunt of claim 20 wherein the first and second cavities are at different elevations in the body when the body is standing erect.
- 22-72. **(CANCELED)**

73. (CURRENTLY AMENDED) ~~The body fluid shunt of claim 1 wherein~~

A body fluid shunt comprising:

a. an inlet port;

b. an outlet port;

c. a fluid passage between the inlet and outlet ports;

d. a valve situated between the inlet and outlet ports, the valve defining:

(1) an upstream side of the fluid passage between the inlet port and the valve, and

(2) a downstream side of the fluid passage between the valve and the outlet port,

and wherein the valve is at least partially defined by a drain port extending between the upstream and downstream sides of the fluid passage;

e. a piston:

(1) having a piston face defined on the upstream side of the fluid passage, wherein at least a portion of the piston face bears a deformable diaphragm,

(2) being displaceable to actuate the valve, and

(3) having a cutout defined therein, wherein:

i. the cutout is alignable with the drain port when the piston is displaced, and

ii. the cutout moves along a curved path to align with the drain port when the piston is displaced,

wherein:

i. fluid bearing on the piston face at or above a shunting pressure will displace the piston to actuate the valve, with alignment of the cutout and the drain port opening the valve to thereby allow passage of fluid between the inlet and outlet ports, and

ii. the position of the piston is independent of the pressure in the downstream side of the fluid passage.

74. (CURRENTLY AMENDED) ~~The body fluid shunt of claim 1 wherein~~

A body fluid shunt comprising:

a. an inlet port;

b. an outlet port;

c. a fluid passage between the inlet and outlet ports;

d. a valve situated between the inlet and outlet ports, the valve defining:

(1) an upstream side of the fluid passage between the inlet port and the valve, and

(2) a downstream side of the fluid passage between the valve and the outlet port,

and wherein the valve is at least partially defined by a drain port extending between the upstream and downstream sides of the fluid passage;

e. a piston:

(1) having a piston face defined on the upstream side of the fluid passage, wherein:

i. the piston face is curved, and rides along a complementarily curved guide wall, and

ii. at least a portion of the piston face bears a deformable diaphragm,

(2) being displaceable to actuate the valve, and

(3) having a cutout defined therein, the cutout being alignable with the drain port when the piston is displaced,

wherein:

i. fluid bearing on the piston face at or above a shunting pressure will displace the piston to actuate the valve, with alignment of the cutout and the drain port opening the valve to thereby allow passage of fluid between the inlet and outlet ports, and

ii. the position of the piston is independent of the pressure in the downstream side of the fluid passage.

75. **(PREVIOUSLY PRESENTED)** The body fluid shunt of claim 74 wherein the drain port is defined in the guide wall.

76-77. **(CANCELED)**

78. **(PREVIOUSLY PRESENTED)** The body fluid shunt of claim 1 wherein the piston is displaced solely by the pressure in the upstream side of the fluid passage.

79. **(PREVIOUSLY PRESENTED)** The body fluid shunt of claim 1 wherein:

- a. the fluid passage has a flow axis centrally located along the fluid passage and extending between the inlet and outlet ports;
- b. the piston has a displacement axis along which the piston is displaced, and
- c. the flow axis and displacement axis are non-parallel.

80. **(PREVIOUSLY PRESENTED)** The body fluid shunt of claim 79 wherein the flow axis and displacement axis are perpendicular.

81-83. **(CANCELED)**

84. **(NEW)** The body fluid shunt of claim 8 wherein the deformable diaphragm has opposing sides defining:

- a. a fluid side, the fluid side being at least partially bounded by the upstream side of the fluid passage, and
- b. a gas side, the gas side being at least partially bounded by a gas chamber, the gas chamber being closed to the ingress of fluid.

85. **(NEW)** The body fluid shunt of claim 84 wherein the gas chamber has selectively adjustable volume, whereby a user may selectively adjust the gas chamber volume to adjust the pressure of gas therein, and thereby adjust the gas pressure on the gas side of the deformable diaphragm.

86. (NEW) The body fluid shunt of claim 8 wherein:
- a. the piston is displaceable along a piston travel axis; and
 - b. fluid flowing through the valve between the upstream and downstream sides of the flow passage flows along a valve flow direction oriented at least substantially perpendicular to the piston travel axis.
87. (NEW) The body fluid shunt of claim 8 wherein the piston includes:
- a. a piston tail end opposite its piston face, and
 - b. an intermediate length extending between its face and piston tail end,
- and wherein the downstream side of the fluid passage opens onto the piston only at the intermediate length of the piston.
88. (NEW) The body fluid shunt of claim 8 wherein the piston has a piston tail end opposite its piston face, and wherein the upstream side of the fluid passage opens onto the piston tail end.
89. (NEW) The body fluid shunt of claim 8 wherein the deformable diaphragm includes:
- a. a fluid side, the fluid side being at least partially bounded by the upstream side of the fluid passage, and
 - b. an opposite side isolated from the upstream side of the fluid passage.
90. (NEW) The body fluid shunt of claim 89 wherein the opposite side is biased by at least one of:
- a. a compressible gas chamber; and
 - b. a spring.
91. (NEW) The body fluid shunt of claim 89 wherein the opposite side is also isolated from the downstream side of the fluid passage.

92. (NEW) The body fluid shunt of claim 91 wherein the pressure on the opposite side is adjustable to a fixed level.
93. (NEW) The body fluid shunt of claim 92 wherein the opposite side is bounded by a gas chamber having selectively adjustable volume, whereby a user may selectively adjust the gas chamber volume to adjust the pressure of gas therein, and thereby adjust the gas pressure on the opposite side of the diaphragm.
94. (NEW) The body fluid shunt of claim 8 wherein the inlet port is in fluid communication with a brain.
95. (NEW) The body fluid shunt of claim 8 wherein the outlet port has an elongated flexible catheter extending therefrom.
96. (NEW) The body fluid shunt of claim 8 wherein:
- a. the inlet port is in fluid communication with a first cavity in a human body, and
 - b. the outlet port is in fluid communication with a second cavity in the body.
97. (NEW) The body fluid shunt of claim 96 wherein the first and second cavities are at different elevations in the body when the body is standing erect.
98. (NEW) The body fluid shunt of claim 73 wherein the inlet port is in fluid communication with a brain.
99. (NEW) The body fluid shunt of claim 73 wherein the outlet port has an elongated flexible catheter extending therefrom.
100. (NEW) The body fluid shunt of claim 73 wherein:
- a. the inlet port is in fluid communication with a first cavity in a human body, and
 - b. the outlet port is in fluid communication with a second cavity in the body.

101. (NEW) The body fluid shunt of claim 100 wherein the first and second cavities are at different elevations in the body when the body is standing erect.
102. (NEW) The body fluid shunt of claim 73 wherein the piston is displaced solely by the pressure in the upstream side of the fluid passage.
103. (NEW) The body fluid shunt of claim 74 wherein the inlet port is in fluid communication with a brain.
104. (NEW) The body fluid shunt of claim 74 wherein the outlet port has an elongated flexible catheter extending therefrom.
105. (NEW) The body fluid shunt of claim 74 wherein:
- a. the inlet port is in fluid communication with a first cavity in a human body, and
 - b. the outlet port is in fluid communication with a second cavity in the body.
106. (NEW) The body fluid shunt of claim 105 wherein the first and second cavities are at different elevations in the body when the body is standing erect.
107. (NEW) The body fluid shunt of claim 74 wherein the piston is displaced solely by the pressure in the upstream side of the fluid passage.